REMARKS

Claims 1–13, 16–22, and 24-45 are currently pending in the present application. In the Office Action, the Examiner rejected claims 1-13, 16-22, and 24-37 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,040,671 to Brito *et al.* ("Brito").

Before addressing the Examiner's rejections of the claims, the disclosed embodiments of the invention will first be discussed in comparison to the applied Brito reference in order to help the Examiner appreciate certain distinctions between the pending claims and the subject matter of the applied reference. Specific distinctions between the pending claims and the applied reference will be discussed after the discussion of the disclosed embodiments and the applied reference. This discussion of the differences between the disclosed embodiments and applied reference should not define the scope or interpretation of any of the claims.

Referring to the embodiment illustrated in Figure 3 of the present application, a drive circuit 36 receives a head control signal on an inverting input of an integrator 50 which develops an output that drives tristatable buffers 52, 54 which, in turn, drive a coil 56. A current feedback amplifier 60 in combination with a resistance R_S senses the current flowing through the coil 56 and the amplifier generates a current signal indicating a magnitude of the sensed current. This current signal is also applied to the inverting input of the integrator 50. A park-unpark circuit 38 includes an amplifier 82 that senses a back voltage across the coil 56 and generates a speed signal output having a value that is a function of the sensed back voltage and which indicates the speed that the head 16 (Figure 1A) is moving. A sample-and-hold circuit 84 samples the speed signal output of the amplifier 82 when the sensed current through the coil 56 has a specific value such as being substantially zero.

In the embodiment of Figure 3, an amplifier 80 generates a sample signal output in response to the current signal from the amplifier 60 having a predetermined value V_{ref}. In response to the sample signal output, the sample-and-hold circuit 84 samples the speed signal output from the amplifier 82, and provides this sampled speed signal through a switch 86 to the inverting input of the integrator 50. The switch 86 closes during a hard-park mode to thereby apply the sampled speed signal to the inverting

input of the integrator 50 and opens during other normal modes, such as when data is being read from or written to the hard disk or during a soft park operation.

Figure 4 of Brito referenced by the Examiner in the Office Action illustrates a control circuit 90 including a transconductance amplifier 108 that drives a coil 68 in response to a current command I_{CMD}. A differencing unit 104 sums an output from a proportional unit 100 and an output from an integrating unit 102 to generate the current command I_{CMD}. A differencing unit 98 receives a retract command voltage V_R and subtracts from this command voltage a sampled feedback back voltage from a sampler 118. The differencing unit 98 provides this difference to the proportional and integrating units 100 and 102. A voltage sense unit 116 senses a back voltage across the coil 68 and applies an output indicating the sensed back voltage to the sampler 118. A timer 120 generates a periodic sample signal that causes the sampler 118 to latch the applied output from the voltage sense unit 116. The timer also periodically generates a float signal that is applied to the transconductance amplifier 108. In response to the float signal, the amplifier 108 stops driving the coil 68.

In operation, the timer 120 periodically activates the FLOAT signal causing the amplifier 108 to stop driving the coil 68. A time later the timer 120 activates the sample signal to cause the sampler 118 to sample the voltage at the output of amplifier 116, which indicates the speed of the actuator model 65. This sampler 118 feeds this sampled speed signal to the unit 98, which then subtracts the speed signal from the command voltage V_R to thereby adjust the value of the current command I_{CMD} ultimately applied to the amplifier 108. When the timer 120 deactivates the float signal a short time later, the amplifier 108 drives the coil 68 using this new current command I_{CMD}.

Amended claim 1 recites a control circuit for controlling a motor assembly having a coil with first and second nodes and having a movable arm. The control circuit includes, in part, a drive circuit operable to be coupled to the first and second nodes of the coil. The drive circuit receives a control signal, a current signal indicating a magnitude of a current flowing through the coil, and a speed signal. The drive circuit generates a drive signal in response to the control, current, and speed signals to drive the coil with the drive signal during drive periods, and to uncouples the drive signal from the coil during measurement periods that alternate with and are separate from the drive

periods. A sensor circuit is coupled to the drive circuit and has first and second sensor nodes operable to be respectively coupled to the first and second nodes of the coil such that no element is in series with the coil between the first and second sensor nodes. The sensor circuit generates the speed signal having a level that corresponds to the speed of the arm.

Brito neither discloses nor suggests a drive circuit as recited in amended claim 1. Brito does not disclose a current signal indicating a magnitude of a current flowing through the coil and a drive circuit that generates a drive signal in response to the control, current, and speed signals to drive the coil. In contrast, in Brito a speed signal from the sampler 118 is subtracted from a command voltage V_R but no current signal indicating the current flowing through the coil 68 is utilized. For these reasons, the combination of elements recited in amended claim 1 is neither disclosed nor suggested by Brito and claim 1 is therefore allowable.

Dependent claims 2 and 3 and new dependent claims 38-40 are allowable for at least the same reasons as claim 1. Furthermore, dependent claim 38 recites the control circuit of claim 1 wherein the sensor circuit is further operable to apply the speed signal to the drive circuit during a hard park mode of operation and to isolate the speed signal from the sensor circuit during a normal mode of operation. Brito neither discloses nor suggests applying the speed signal to the drive circuit only during hard parks and isolating the signal during a normal mode of operation. Instead, Brito always applies the speed signal from the sampler 118 to the unit 98 and thus signal is always utilized in generating the I_{CMD} to drive the coil 68. Dependent claim 38 is thus allowable for these additional reasons. With regard to dependent claim 40, this claim recites the control circuit of claim 1 wherein the drive circuit is operable to generate the drive signal in response to the sum of the control, current, and speed signals. Brito does not disclose or suggest summing a control, current, and speed signal to generate the drive signal that drives the coil 68. Claim 40 is accordingly allowable for these additional reasons.

Independent claim 4 recites a control circuit for controlling a read-write head assembly during a park or unpark operation. The head assembly includes a motor assembly having a coil and a movable arm and also includes a read-write head coupled

to the arm. The control circuit includes, in part, a drive circuit operable to receive a control signal, a current signal indicating a magnitude of a current flowing through the coil, and a speed signal, to generate a drive signal in response to the control, current, and speed signals, to drive the coil in response to the control and speed signals during drive periods, and to uncouple the drive signal from the coil during measurement periods that alternate with and are separate from the drive periods such that the read-write head moves to or from a ramped parking platform at a speed that is approximately five inches per second for a predetermined time period. Once again, Brito neither discloses a drive circuit that utilizes a current signal indicating the current flowing through the coil in generating a drive signal to drive the coil. Accordingly, the combination of elements recited in claim 4 is allowable.

Dependent claims 5-7 are allowable for at least the same reasons as claim 4. Moreover, dependent claim 5 recites the control circuit of claim 4 wherein the drive circuit is operable to generate the drive signal in response to the sum of the control, current, and speed signals. As discussed above with regard to dependent claim 40, Brito neither discloses nor suggests generating the drive signal in the recited way and dependent claim 5 is thus allowable for these additional reasons. With regard to dependent claim 6, this claim recites the control circuit of claim 4 wherein the sensor circuit is operable to sense the speed of the read-write head by sensing a back voltage across the coil during a portion of each measurement period when the magnitude of the current signal indicates that approximately zero current is flowing through the coil. Brito does not generate a current signal indicating current flowing through the sensor and having a magnitude that indicates the current flowing the sensor is approximately zero. Instead, Brito relies on periodically developed SAMPLE signal to estimate such a condition. Dependent claim 6 is therefore allowable for these additional reaons.

Independent claim 8 recites, in part, a control circuit including a drive circuit that has a feedback input terminal adapted to receive a current signal indicating a magnitude of a current flowing through the coil. The drive circuit of Brito includes no such signal and the combination of elements recited in claim 8 is accordingly allowable. Dependent claims 9-11 are allowable for at least the same reasons as claim 8. Moreover, dependent claim 10 recites the control circuit of claim 8 further including a

switching circuit coupled between the feedback input terminal and the output terminal of the of the speed-sense circuit, the switching circuit being operable to couple the feedback input to the output terminal responsive to a control signal being active and to isolate the feedback input from the output terminal responsive to the control signal being inactive. Brito fails to disclose or suggest such a switching circuit and claim 10 is therefore allowable for these additional reasons.

Claims 12, 13, 16-22, and 24-37 are allowable similar to the reasons set forth with regard to claims discussed above and thus, for the sake of brevity, the allowability of each of these claims will not be individually discussed.

New independent claim 41 recites a control circuit for controlling a motor assembly having a coil with first and second nodes and having a movable arm. The control circuit includes, in part, a drive circuit adapted to be coupled to the first and second nodes of the coil and adapted to receive a control signal, a current signal indicating a magnitude of a current flowing through the coil, and a speed signal. The drive circuit is operable in a drive mode to generate a drive signal in response to the control, current, and speed signals during a hard-park submode of operation and to generate the drive signal in response to the control and current signals during a normal submode of operation. The drive circuit is further operable to apply the drive signal to drive the coil during the drive mode and is operable during a measurement mode to isolate the drive signal from the coil.

Brito neither discloses nor suggests a drive circuit as recited in new claim 41. As previously discussed, the drive circuit in Brito does not generate a drive signal in response to control, current, and speed signals during a hard-park submode of operation. In contrast, Brito includes no such current signal and does not distinguish between the signals utilized during hard park versus all other modes of operation. Moreover, the drive circuit of Brito does not generate the drive signal in response to the control and current signals during a normal submode of operation. Brito includes no such current signal. For these reasons, the combination of elements recited in new claim 41 is allowable.

Dependent claims 42-45 are allowable for at least the same reasons as claim 44. Furthermore, dependent claim 42 recites the control circuit of claim 41 wherein the

sensor circuit is further operable to apply the speed signal to the drive circuit during the hard-park submode of operation and to isolate the speed signal from the drive circuit during the normal submode of operation. The speed signal in Brito is fed back independent of the modes of operation of the circuit, and includes no sensor circuit that applies the speed signal to the drive circuit during the hard-park submode of operation and isolates the speed signal from the drive circuit during the normal submode of operation. Claim 42 is thus allowable for these additional reasons. Dependent claim 44 is additionally allowable for reasons similar to those set forth above with regard to claim 40.

Dependent claim 45 recites the control circuit of claim 41 wherein the speed sensor circuit is operable to sample a back voltage across the coil responsive to the current signal indicating a predetermined current is flowing through the coil during the measurement mode of operation, and wherein the speed sensor circuit is further operable to generate the speed signal having a value that is function of the sampled back voltage. Brito does not sample back voltage across the coil responsive to the current signal indicating a predetermined current is flowing through the coil. Claim 45 is thus allowable for these additional reasons.

The present patent application is in condition for allowance. Favorable consideration and a Notice of Allowance are respectfully requested. The Examiner is requested to contact the undersigned at the number listed below for a telephone interview if, upon consideration of this amendment, the Examiner determines any pending claims are not in condition for allowance. The undersigned also requests the Examiner to direct all future correspondence to the address set forth below in the event the Examiner shows a different correspondence address for the attorney of record. In the event additional fees are due as a result of this amendment, please charge such payment to Deposit Account No. 07-1897.

DATED this 13th day of April, 2005.

Respectfully submitted,

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